



U. S. DEPARTMENT OF AGRICULTURE

Office of Information

Press Service



Release - Immediate

August 16, 1928.

WATERFOWL CENSUSES OF BIOLOGICAL SURVEY DEVELOPING VALUABLE CONSERVATION DATA

Efforts to ascertain the fluctuations in the abundance of migratory waterfowl in North America, undertaken by the Bureau of Biological Survey, United States Department of Agriculture, one year ago and persistently followed up since then, are meeting with gratifying success. The accomplishments already indicate that the original conception of the project was conservative, not over-enthusiastic, and that information will ultimately be derived from the censuses that will be of inestimable value in the formulation of a sound policy for the conservation of the country's waterfowl resources. The birds under consideration in this far-reaching cooperative undertaking, include not only the ducks, geese, and cranes, which collectively are termed "waterfowl," but also the American coot, or mudhen."

Purposes and Progress

Efforts of organizations and individuals looking toward the conservation of waterfowl and the preservation of the important recreation of waterfowl hunting had recently developed the necessity for more definite and accurate information regarding the distribution and abundance of the game birds of the country than has hitherto been available. This is particularly necessary in Canada and the United States, in connection with the enforcement of provisions of the migratory-bird treaty negotiated to protect birds that fly between these two countries; and it is also desirable in Mexico, in view of the great numbers of North American waterfowl that winter in that country. In order to obtain the information required, particularly with regard to the distribution and movements of waterfowl, and their fluctuations in numbers from year to year, a series of waterfowl censuses was inaugurated by the Biological Survey on August 20, 1927, and these are now being carried on at important concentration and breeding areas of the birds throughout much of North America.

These censuses are being taken monthly on a designated day by more than

3,000 voluntary cooperators of the Biological Survey, and at each concentration area of the birds counts or estimates of their abundance are made. These observers represent every State in the Union and all the Provinces of Canada, as well as Alaska and Porto Rico. The important elements in obtaining the information are the simultaneous character of this project and the fact that the work is carried on at salient points over practically all of the North American continent. The dates for the censuses are fixed in advance, and fall on the Saturday nearest the 10th of each month, the exact dates being communicated a long time in advance to each observer so that all may have opportunity to make necessary arrangements for carrying on the work.

Cooperators

Cooperation has been obtained from virtually all the State game and conservation commissions and also from Canadian authorities, through the cooperation of the Office of National Parks of Canada and the game-protection officials of the different Provinces. In addition, many United States Government bureaus and services are giving cordial support, including the Forest Service, Weather Bureau, and Extension Service in the Department of Agriculture; the National Park Service, Office of Indian Affairs, and Bureau of Reclamation in the Department of the Interior; the Bureau of Education in the Department of Labor; the Bureau of Lighthouses and Bureau of Fisheries in the Department of Commerce; the Coast Guard in the Treasury Department; and the Office of Engineers in the War Department. Invaluable aid is also being given by individual sportsmen, conservationists, ornithologists, and other individuals and their organizations.

So cordial and important has been the cooperation given by various National, State, and Provincial organizations, public and private, that among these it is difficult to pick out special organizations for mention by name. So many of the States and Provinces have offered their entire warden force for service in this work, however, and so much valuable information has been gathered from them, that officials of the Biological Survey consider that this fact deserves particular mention. State and Provincial officials are showing great interest in this project and realize that as the results benefit the country as a whole, the individual

units will profit by the undertaking. The Izaak Walton League of America has assisted in many ways, not only through its national but through its State organizations, and has promised its assistance in every way in its power. The same is true of the American Wild Fowlers, which organization has cooperated most heartily and effectively with the Biological Survey.

By a mutually advantageous arrangement, the Office of National Parks of Canada is conducting the taking of these censuses in Canada with the help and hearty cooperation of the Biological Survey. Valuable information is thus being gathered in various parts of Canada, which will not only throw much light on the general waterfowl problem but will be vital to the conservation of the game birds of every one of the Canadian Provinces and Territories. How important this is may be known from the fact that the great breeding ground of the waterfowl of North America is situated in Canada and Alaska, and accurate information regarding waterfowl conditions throughout this vast area is essential to the success of any conservation plan. The preservation of the breeding grounds and satisfactory breeding conditions, which is the problem for Canada, is inevitably linked with the equally important problem of their conservation in the United States and Mexico during the migration and wintering periods. These waterfowl censuses, therefore, will serve Canada fully as much as they will the United States.

Methods of Taking Censuses

The cooperating observers select an area that can be covered by a waterfowl census in a single day, usually the one in their vicinity that is frequented by the largest number of waterfowl, and one that is extensive enough to give a good idea of typical conditions in the locality. This area is so defined that it can be readily identified for future work there, since it is essential that the waterfowl censuses be taken on the same areas month after month and year after year, if the results are to be comparable. Sketch

maps of the areas covered by the different observers furnish accurate means of recording and of identifying areas on which the censuses are taken.

An actual count of species of all the waterfowl^{present} is made, unless the numbers are so great as to make such count impossible, under which circumstances careful estimates are made. The methods pursued in this sort of work are such as have been found satisfactory by ornithologists of the Biological Survey after many years of experience. In estimating the numbers in a large flock it has been found best to count a certain portion of it, and then, using this as a unit of measure, to estimate the remainder. Blocks of 100 and 1,000 birds have been found to be convenient units, whether the birds are on the wing or resting on the water. In the latter case it is often possible to estimate the number of birds in a typical square yard, and then multiply this number by the estimated number of square yards covered by the flock. Where birds are scattered in mixed flocks of several species over a large area, the proportion of the entire flock made up by each species is carefully estimated, and in this way the relative abundance of all the species is obtained.

Accuracy in Observations and Reports

To make the results obtained dependable, great emphasis is laid on the care that should be taken in making and recording all observations. All the observers are urged to leave nothing to memory, but to make a careful record of all birds at the time they are observed, and to avoid counting the same ones twice. The accuracy of these waterfowl censuses, and therefore their value, depends directly on the speed and completeness with which they can be organized and conducted. These factors in turn depend almost wholly on the personnel and other assistance that can be obtained. To facilitate the work of enlisting cooperation from organizations and individuals, and also to obtain first-hand information regarding local conditions in the various States, field trips have been made from the headquarters offices of the Biological Survey in Washington to most of the States of the United States and the Provinces of Canada. These visits have the further beneficial effect, not only of supervising the project, but, in working up the results of the censuses, of more satisfactorily evaluating and using the data gathered.

Reports of censuses taken in the United States, Alaska, and Mexico are made monthly to the Biological Survey, and of those taken in Canada to the Office of National Parks of Canada. Uniform report cards are provided for the purpose, so that for each census taken information is furnished regarding the actual or estimated number of each species seen at each station, the weather conditions, and the food supply, together with any other circumstances that may have a bearing upon the presence or absence of waterfowl.

Results of First Year's Work

It will, of course, be necessary to have the second year's observations as a basis for computations of increase or decrease of species or of waterfowl as a whole, but several very interesting facts have already been brought out by the censuses up to the present time. Owing to the surprising response that has been made to the requests for cooperation, the vast store of information gathered in the first year of the work has been far in excess of any reasonable expectation. The data obtained have been filed and indexed for ready reference.

These results show particularly the winter concentration areas in the United States during the past year and the striking fact is brought out, more clearly than ever before, that the birds that breed in Canada and migrate over the United States withdraw into surprisingly small areas for the winter. These areas lie chiefly along the Atlantic Coast from Long Island southward; along the Gulf coast; up the lower Mississippi Valley; along the Pacific Coast; with comparatively few scattered, relatively small areas throughout the middle and western United States. In addition to this, the waterfowl, chiefly ducks, that winter in Mexico are gathered into about six important areas, from which unfortunately very little information was received during the past year, and which must needs be covered adequately in order to supplement the information now available. Among the most important of the other facts brought out by these waterfowl censuses are the movements of the bulk of the waterfowl east and west, as well as north and south, particularly during migration, the location of the bulk of the birds during different months, and monthly fluctuations in these movements.

To show these facts, a series of preliminary maps has been prepared indicating conditions and locations of the bulk of waterfowl on each of the waterfowl census dates in the United States and southern Canada, from which areas the most satisfactory information has hitherto been received. These maps are filed in the Biological Survey offices, as well as the other information gathered through these waterfowl censuses, and will become more serviceable when all necessary data can be more carefully analyzed and examined and any errors eliminated, for in handling a project of such magnitude it is of course necessary and desirable to exercise all possible precaution to see that the deductions from the data considered represent the true conditions.

One of the most encouraging features of the past year's organization and conduct of these waterfowl censuses has been the almost universal interest and cordial offers to cooperate that have been met with everywhere. The purposes of these censuses are apparently appreciated and the method fully approved by those to whom it has been explained, and the future success of the work seems assured. The Biological Survey hopes to enroll additional observers as soon as possible, particularly in Canada and Mexico, to cover all the important concentration areas, so that the facts gathered may approximate as nearly as possible the exact waterfowl conditions over the North American continent.

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